State of Wisconsin

Department of Revenue

Non-Statistical Sampling

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CAUTION

The information in this publication reflects the interpretations by the Wisconsin Department of Revenue of laws enacted by the Wisconsin Legislature as of February 15, 2006. Laws enacted after that date, administrative rules, and court decisions may change the interpretations in this publication.

I. INTRODUCTION

This publication provides information about non-statistical sampling used in field audits by the Wisconsin Department of Revenue. It explains when and why sampling is used, the factors considered in determining if sampling will be used, how sampling results are calculated and special situations that can affect sampling results. The two most common non-statistical sampling methods used in audits, the alpha sample and the time-based sample, are explained in Part V. Throughout this publication the word sampling refers to non-statistical sampling.

II. WHAT IS SAMPLING AND WHY IS IT USED?

Sampling is selecting representative items from a universe (a group of items), examining those selected items and drawing a conclusion about the entire universe based on that examination of the selected items.

Sampling is generally used in field audits when it is not efficient to review 100% of the records. Sampling may also be used if records are missing or other circumstances make reviewing all of the records difficult (for example, problems in retrieving records due to off-site storage of early year's records).

Not all transactions will be sampled. Even if a sample is used to review a certain area, it is possible that a 100% examination of transactions could be used for other areas of the taxpayer's business. For example, vehicle sales by an automobile dealership are not normally sampled. Capital additions (for example, machinery and equipment), for most taxpayers, are subject to a 100% examination.

The use of sampling in sales and use tax audits is authorized by sec. 77.59(2), Wis. Stats.

III. DETERMINING WHETHER SAMPLING IS TO BE USED

Usually at the initial conference of a field audit, the auditor will ask several questions to determine the best method to review the records. Among the areas of interest are:

- Products or services sold or manufactured
- Typical customers or vendors
- Location of business operations
- Business organization (that is, divisions, departments, plants, stores)
- Location and order of the documents kept (that is, sales and purchase invoices)
- Volume of records (that is, the number of file drawers or boxes of documents per year or the number of transactions per month)
- Changes in business operations during the audit period (for example, business expansion)
- Busy seasons as opposed to slow times
- Economic cycles
- Unusual occurrences, such as a strike or plant shutdown

The above factors are considered in determining whether sampling will be used. The volume of the sales and/or purchase transactions and the method of filing the records are typically the two most important factors in determining if a sample will be used and the method of sampling.

If sampling is used, the decision on the sampling method is usually made by the auditor and approved by the audit supervisor. The sample will be explained to the taxpayer by the auditor prior to the actual review of the records. When the nature of a taxpayer's business presents problems which affect the sample, a department sampling specialist may be consulted. In such cases a meeting may be scheduled with the taxpayer, the auditor and the sampling specialist to address the problem areas.

After the sampling method is established, the auditor will review the documents selected to determine what errors, if any, have occurred. After the dollar amount of the errors has been determined, the results of the sample are computed by projecting the errors found and allocating the results over the period of the audit.

IV. SAMPLING METHODS

The type of sampling method used is usually determined by the manner in which the records to be examined are filed. In most cases, records are maintained in alphabetic or chronological order. Therefore, the two most common sampling methods used are the alpha sample and the time-based sample.

ALPHA SAMPLE:

When the documents to be examined are filed alphabetically by customer or vendor name, the alpha sample selection method is generally used. Vendors are assigned alphabetically to each year of the audit in such a manner that an equal share of the documents are examined each year (that is, approximately one-fourth of the purchase invoices will be reviewed for each year in a four year audit of purchases, one third of each year will be reviewed in a three year audit, etc.). For example, assume the audit covers a four year period. An alpha sample for use tax on purchases could be set up as follows: Year 1 - Vendors A through D; Year 2 - Vendors E through J; Year 3 - Vendors K through R; Year 4 - Vendors S through Z.

TIME-BASED SAMPLE:

When the documents to be examined are filed chronologically, a time-based sampling method is generally used. The most common time based method is to select one month's transactions for review for each year under audit. For example, assume the audit covers the four year period January 1, 2002 through December 31, 2005. A one-month-per-year sales tax sample could be set up as follows: Year 1 (2002) - October 2002 sales invoices; Year 2 (2003) - July 2003 sales invoices; Year 3 (2004) - February 2004 sales invoices; Year 4 (2005) - April 2005 sales invoices. The months selected would be representative of the annual business cycle (in terms of business activity: one busy month; one slow month; and two average months).

Based on the nature of the taxpayer's business activity, daily and weekly time based samples may also be used.

V. HOW ARE THE RESULTS OF THE SAMPLE CALCULATED?

Various methods can be used to take the measure of errors found in a sample and project them into an additional measure of tax for the audit period. The most common projection methods used are explained below.

ALPHA SAMPLE:

The formula for determining the additional measure of tax for the audit period in an alpha sample is:

(Errors from Sample) X (Periods In Audit) = Total Additional Measure of Tax

For example, assume the following errors were obtained from a four year alpha sample of purchases:

	ADDITIONAL MEASURE OF USE TAX FROM SAMPLE
Year 1 - Vendors A through D	$1,000
Year 2 - Vendors E through J	$1,200
Year 3 - Vendors K through R	$1,300
Year 4 - Vendors S through Z	$1,500
Total	$5,000

The average annual additional measure of tax is $5,000 (the sum of the four years' errors found in the sampled purchases). This amount is multiplied by 4 (the number of years audited) to arrive at the total additional measure of tax for the four year audit period, $20,000.

The total additional measure is then allocated over the four year audit period. One method of allocating the total additional measure uses total sales. Assuming that the company had the following sales, the total additional measure of tax, $20,000, would be allocated as follows:

	GROSS SALES PER YEAR	% GROSS SALES PER YEAR TO TOTAL GROSS SALES	ADDITIONAL MEASURE OF USE TAX ALLOCATED TO EACH AUDIT YEAR
Year 1	$ 4,000,000	16%	$ 3,200
Year 2	$ 5,000,000	20%	$ 4,000
Year 3	$ 6,000,000	24%	$ 4,800
Year 4	$10,000,000	40%	$ 8,000
Totals	$25,000,000	100%	$20,000

The allocation method does not change the amount to be projected. It only affects what portion of the total

additional measure is allocated to each year. In the above example, Year 1 has a percentage of gross sales to total gross sales of 16% ($4,000,000 ÷ $25,000,000). 16% of the total $20,000 error, or $3,200, is allocated to Year 1, etc.

An allocation based on gross sales as shown above is one example of an allocation method used by the department. Other allocation methods may also be used by the department (for example, time or other measurements of activity such as gross purchases). The selection of an allocation method depends on the facts and circumstances of each case.

TIME-BASED SAMPLE:

In a time-based sample, the errors from each year are totaled. The ratio projection method or average projection method is then used to determine the additional measure of tax for the audit period.

Ratio Projection Method:

The formula for determining the additional measure of tax for the audit period in a time-based sample, using the ratio projection method, is as follows:

$$\frac{\text{(Errors from Sample)}}{\text{(Amount of Sales, Purchases, etc., from Sample Period)}} \times \text{(Amount of Sales, Purchases, etc., from Audit Period)} = \text{Total Additional Measure of Tax}$$

For example, assume the following errors were obtained from a one-month-per-year sales tax sample:

	ADDITIONAL MEASURE OF SALES TAX FROM SAMPLE
Year 1 - October	$1,000
Year 2 - July	$1,200
Year 3 - February	$ 800
Year 4 - April	$2,000
Total	$5,000

Assume that sales for the months sampled and yearly sales are as follows:

	MONTHLY SALES	YEARLY SALES
Year 1 - October	$ 650,000	$ 8,000,000
Year 2 - July	$ 850,000	$10,000,000
Year 3 - February	$1,100,000	$15,000,000
Year 4 - April	$2,000,000	$22,200,000
Totals	$4,600,000	$55,200,000

The errors for the sample months total $5,000. A ratio is computed by dividing the $5,000 in sample errors by the total monthly sales for the months sampled, $4,600,000. In this example, the error ratio for the sample is .1087% ($5,000 ÷ $4,600,000). This ratio is then multiplied by the yearly sales to arrive at the total additional measure of sales tax from the sample.

	YEARLY SALES	X	ERROR RATIO	=	ADDITIONAL MEASURE OF SALES TAX ALLOCATED TO EACH AUDIT YEAR
Year 1	$ 8,000,000		.001087		$ 8,696
Year 2	$10,000,000		.001087		$10,870
Year 3	$15,000,000		.001087		$16,304
Year 4	$22,000,000		.001087		$24,130
Totals	$55,200,000				$60,000

The total additional measure of sales tax from the sample as projected using the ratio method is $60,000.

Average Projection Method:

The formula for determining the additional measure of tax for the audit period in a time-based sample using the average projection method is as follows:

$$\frac{\text{(Errors from Sample)}}{\text{(Number of Periods Sampled)}} \times \text{(Total Number of Periods in the Audit)} = \text{Total Additional Measure of Tax}$$

Assume the same facts as in the ratio projection method example above. The average monthly adjustment is $1,250 ($5,000 total sample errors ÷ 4, the number of months sampled). This average monthly adjustment is then multiplied by the 48 months in the audit period to arrive at the total additional measure of tax, $60,000. This additional measure is allocated to each year as follows:

	GROSS SALES PER YEAR	% GROSS SALES PER YEAR TO TOTAL GROSS SALES	ADDITIONAL MEASURE OF USE TAX ALLOCATED TO EACH AUDIT YEAR
Year 1	$ 8,000,000	14.5%	$ 8,700
Year 2	$10,000,000	18.1%	$10,860
Year 3	$15,000,000	27.2%	$16,320
Year 4	$22,200,000	40.2%	$24,120
Totals	$55,200,000	100.0%	$60,000

VI. SPECIAL SITUATIONS

Unusually Large Dollar Transactions:

When a large dollar error is included in the sample results, the overall sample projection could be distorted. For example, a $15,000 error is discovered in a sales tax sample when most errors range from $500 to $2,500.

The solution to this situation is to remove the $15,000 transaction from the sample projection. If a large item is removed from the sample, then additional records must be examined. One common approach is to examine all sales over a certain dollar amount. Any resulting errors would be included in the additional measure of tax, but would *not* be projected. A sales journal might be used to identify the large dollar sales. The facts and circumstances of the taxpayer's business determine what is an unusually large error.

Missing Records:

Sometimes business records are missing for part or most of the audit period. The most common reasons for missing records are catastrophic events (for example, fire, flood), human error (for example, mislabeling or destroying documents) or business decisions (for example, business has been sold, the records are in off-site storage). It is the taxpayer's responsibility to retain the necessary records to determine the correct sales and use tax liability (sec. 77.61(4)(a), Wis. Stats.). When records are missing, the results from the review of the available records will be projected into the period for which records are not available.

For example, if sales records for Year 1 and 6 months of Year 2 were destroyed in a fire, the records for the remaining 6 months of Year 2 and Years 3 and 4, would be reviewed using a sample or a 100% examination. The results of the Year 2, 3 and 4 examination would be projected into the period for which the records no longer exist. A ratio is generally used. Assume a one-month-per-year sample with the following results:

	ADDITIONAL MEASURE OF SALES TAX FROM SAMPLE	MONTHLY SALES
Year 1 - September	$ 400	$ 700,000
Year 2 - May	$1,050	$8500,000
Year 3 - January	$1,350	$1,250,000
Totals	$2,800	$2,800,000

The error rate computation would be the $2,800 in total additional measure divided by $2,800,000 in total sales for the months sampled, which is .001. The error rate would be multiplied by the total sales for each year (including the period for which records were unavailable) to arrive at the total additional measure of sales tax as follows:

	YEARLY SALES	X	ERROR RATIO	=	ADDITIONAL MEASURE OF SALES TAX ALLOCATED TO EACH AUDIT YEAR
Year 1	$ 6,000,000		.001		$ 6,000
Year 2	$ 8,000,000		.001		$ 8,000
Year 3	$11,000,000		.001		$11,000
Year 4	$15,000,000		.001		$15,000
Totals	$40,000,000				$40,000

Misclassified and Misfiled Items:

Transactions that are misclassified or misfiled do not require an adjustment to the projection. The audit covers the records as they exist, not as they should be maintained.

An example of a misclassified item would be a $5,000 purchase of office furniture that was expensed rather than capitalized. An example of a misfiled item would be a sale in the month of June that was included with the sales from the month of July.

If misclassified or misfiled items result in an unusually large error being included in the sample, an adjustment to the projection will be made. For example, if an office furniture purchase of $5,000 substantially exceeded other expensed purchases, a specific adjustment for the item would be made rather than projecting the error. Likewise, if a June sale, which was filed in with the July records, was not representative of the typical sales made, a specific adjustment for the item would be made rather than projecting the error.

Double Inclusion:

In an alpha sample the same type of error could be included twice. This situation occurs when a specific type of item is purchased exclusively from a single vendor and that vendor changes during the audit period. For example, during Years 1 and 2 all office supplies are purchased exclusively from ABC Office Supply; in Years 3 and 4 office supplies are purchased exclusively

from OPQ Office Supply. None of the office supply purchases were taxed. If the alpha sample for Year 1 included the letters A through D and in Year 3 included the letters K through R, the total amount of error from untaxed office supply purchases would be overstated. The overstatement occurs because the errors from ABC Office Supply and OPQ Office Supply are both multiplied by four when the alpha sample results are calculated.

One solution to the problem would be to review the purchases from both vendors in their entirety. Another solution would be to weight the purchases from each office supply vendor by multiplying the errors by a factor (50%) before any sample projection.

Law Changes:

Law changes can affect a sample if the taxability of a particular type of transaction changes during the audit period. For any sample selection method, the universe of the sample must be defined (or redefined) to separate transactions before and after the law change.

For example, a taxpayer is in the business of selling widgets and other products. A law change exempts widgets from sales tax starting in Year 4 of the audit. Two separate samples would be conducted. One sample would cover the first three years when the widgets are taxable, the second sample would cover the period when the widgets were exempt.

VII. COUNTY, STADIUM AND ANY OTHER SALES BASED TAX PROJECTIONS

The same sample used to compute an adjustment for state sales and/or use tax purposes may also be used to compute county, stadium or other sales based tax adjustments.

VIII. COMPLETION OF THE SAMPLE

After the auditor has reviewed the sampled transactions and discussed errors with the taxpayer, sample computations are made. The sample results are reviewed by the audit supervisor and/or the sampling specialist, prior to being presented to the taxpayer. The auditor will then explain the sample results to the taxpayer.

IX. QUESTIONS ABOUT THE SAMPLE

All questions about sampling should be addressed to the auditor and/or the auditor's supervisor. It is a goal of the Department of Revenue that every sampling procedure be understood by the taxpayer.